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## CLAIMS:

1. A transmitter comprising:
  - a power amplifier (PA) having an amplifier power-supply input (PI) and an output (PAO) for supplying a transmission signal (Vo) with an output power (Po),
  - a power supply (PS) having power supply outputs (PSO1, PSO2) for
  - 5 supplying a first power supply voltage (PV1) and a second power supply voltage (PV2),
  - a switching circuit (SC) arranged between the power supply outputs (PSO1, PSO2) and the amplifier power-supply input (PI), and
  - a controller (CO) having an input for receiving a power change command (PC) to control:
  - 10 (i) firstly, the switching circuit (SC) to supply the first power supply voltage (PV1) to the amplifier power-supply input (PI), and the power supply (PS) to vary a level of the second power supply voltage (PV2), the level of the second power supply voltage (PV2) being lower or higher than a level of the first power supply voltage (PV1) if the power change command (PC) indicates that the output power (Po) has to decrease or increase,
  - 15 respectively, and
  - (ii) secondly, the switching circuit (SC) to supply the second power supply voltage (PV2) to the amplifier power-supply input (PI).
2. A transmitter as claimed in claim 1, wherein the transmitter is a handheld
- 20 apparatus (HH) and further comprises a receiving circuit (RC) for receiving a power control signal (PCB) from a base station (BS) to supply the power change command (PC).
3. A transmitter as claimed in claim 2, wherein the transmitter is arranged for
- operation in a transmission system based on time slots (n-1, n, n+1) and a transition period
- 25 (Tsw) during which the output power (Po) should be adapted, the transition period (Tsw) overlapping an end and/or a start of two successive time slots (n-1, n, n+1), respectively, and wherein the controller (CO) is adapted for controlling,
  - firstly, the power supply (PS) to vary a level of the second power supply voltage (PV2), in response to receiving the power change command (PC), while the

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switching circuit (SC) is controlled for supplying the first power supply voltage (PV1) to the amplifier power-supply input (PI), and,

secondly, the switching circuit (SC) to supply the second power supply voltage (PV2) to the amplifier power supply input (PI) during the transition period (Tsw).

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4. A transmitter as claimed in claim 1, wherein the controller (CO) is adapted for controlling the power supply (PS) to vary the level of the second power supply voltage (PV2), starting at substantially the instant the power change command (PC) is received.

10 5. A transmitter as claimed in claim 1, the power supply (PS) being arranged to supply a third power supply voltage (PV3), the controller (CO) being adapted for controlling

(i) the level of the second power supply voltage (PV2) to above a level of the first power supply voltage (PV1), and a level of the third power supply voltage (PV3) to below the level of the first power supply voltage (PV1),

15 (ii) the switching circuit (SC) to supply either the second power supply voltage (PV2) or the third power supply voltage (PV3) to the amplifier power-supply input (PI), depending on whether the output power (Po) has to increase or decrease, respectively.

6. A transmitter as claimed in claim 5, wherein the transmitter is arranged for  
20 operation in a transmission system based on time slots (n), and wherein the controller (CO) is adapted to control, in one of the time slots (n-1, n, n+1) wherein the output power (Po) has to be changed, the level of the second power supply voltage (PV2) or the level of the third power supply voltage (PV3), depending on whether the level of the second power supply voltage (PV2) or the level of the third power supply voltage (PV3) has the largest difference  
25 with the level of a power supply voltage (PV) supplied to the amplifier power-supply input (PI).

7. A transmitter as claimed in claim 5, wherein the transmitter is arranged for  
operation in a transmission system based on time slots (n), and wherein the controller (CO) is  
30 adapted to control, in one of the time slots (n-1, n, n+1) wherein the output power (Po) has to be changed, the power supply (PS) to adapt

(i) the level of the first power supply voltage (PV1) and the level of the third power supply voltage (PV3) if the second power supply voltage (PV2) is supplied to the amplifier power-supply input (PI), wherein the level of the first power supply voltage (PV1)

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is controlled for crossing the level of the second power supply voltage (PV2), or

(ii) the level of the first power supply voltage (PV1) and the level of the second power supply voltage (PV2) if the third power supply voltage (PV3) is supplied to amplifier power-supply input (PI), wherein the level of the first power supply voltage (PV1) is controlled for crossing the level of the third power supply voltage (PV3).

8. A method in a transmitter comprising:

a power amplifier (PA) having an amplifier power-supply input (PI) and an output (PAO) for supplying a transmission signal (Vo) with an output power (Po),

a power supply (PS) having power supply outputs (PSO1, PSO2) for supplying a first power supply voltage (PV1) and a second power supply voltage (PV2), and

a switching circuit (SC) arranged between the power supply outputs (PSO1, PSO2) and the amplifier power-supply input (PI),

in response to a received power change command (PC), the method comprising successively:

controlling (CO) the switching circuit (SC) to supply the first power supply voltage (PV1) to the amplifier power-supply input (PI), and the power supply (PS) to vary a level of the second power supply voltage (PV2), the level of the second power supply voltage (PV2) being lower or higher than a level of the first power supply voltage (PV1) if the power change command (PC) indicates that the output power has to decrease or increase, respectively, and

controlling (CO) the switching circuit (SC) to supply the second power supply voltage (PV2) to the amplifier power-supply input (PI).

9. A method as claimed in claim 8, wherein the transmitter is arranged for operation in a transmission system based on time slots (n-1, n, n+1), and a transition period (Tsw) during which the output power (Po) should be adapted, the transition period (Tsw) overlapping an end and/or a start of two successive time slots (n-1, n, n+1), respectively, and wherein the controlling (CO) is adapted for controlling,

firstly, the power supply (PS) to vary a level of the second power supply voltage (PV2), in response to receiving the power change command (PC), while the switching circuit (SC) is controlled for supplying the first power supply voltage (PV1) to the amplifier power-supply input (PI), and,

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secondly, the switching circuit (SC) to supply the second power supply voltage (PV2) to the amplifier power supply input (PI) during the transition period (Tsw).

10. A system comprising a base station and a transmitter comprising:  
5 a power amplifier (PA) having an amplifier power-supply input (PI) and an output (PAO) for supplying a transmission signal (Vo) with an output power (Po),  
a power supply (PS) having power supply outputs (PSO1, PSO2) for supplying a first power supply voltage (PV1) and a second power supply voltage (PV2),  
a switching circuit (SC) arranged between the power supply outputs (PSO1,  
10 PSO2) and the amplifier power-supply input (PI), and  
a controller (CO) having an input for receiving a power control signal (PCB) from the base station (BS) to supply a power change command (PC) to control:  
(i) firstly, the switching circuit (SC) to supply the first power supply voltage (PV1) to the amplifier power-supply input (PI), and the power supply (PS) to vary a level of  
15 the second power supply voltage (PV2), the level of the second power supply voltage (PV2) being lower or higher than a level of the first power supply voltage (PV1) if the power change command (PC) indicates that the output power has to decrease or increase, respectively, and  
(ii) secondly, the switching circuit (SC) to supply the second power supply voltage (PV2) to the amplifier power supply input (PI) during a transition period (Tsw)  
20 occurring at an end of a present one of the time slots (n-1, n, n+1) and a start of a next one of the time slots (n-1, n, n+1).
11. A system as claimed in claim 10, wherein the transmitter is arranged for operation in a transmission system based on time slots (n-1, n, n+1), and a transition period  
25 (Tsw) during which the output power (Po) should be adapted, the transition period (Tsw) overlapping an end and/or a start of two successive time slots (n-1, n, n+1), respectively, and wherein the controller (CO) is adapted for controlling,  
firstly, the power supply (PS) to vary a level of the second power supply voltage (PV2), in response to receiving the power change command (PC), while the  
30 switching circuit (SC) is controlled for supplying the first power supply voltage (PV1) to the amplifier power-supply input (PI), and,  
secondly, the switching circuit (SC) to supply the second power supply voltage (PV2) to the amplifier power supply input (PI) during the transition period (Tsw).